

ABSTRACT

An improved polish stop or etch stop material for use in semiconductor device manufacturing. An alloy of titanium nitride having an increased hardness when
5 compared to the prior art titanium nitride material is selected to reduce the material removal rate during chemical mechanical polishing (CMP) or plasma etching processes. Titanium nitride may be alloyed with aluminum to form titanium aluminum nitride (TiAlN) for use as either a polish stop material or an etch stop material. Titanium nitride may be alloyed with carbon to form titanium carbon nitride
10 (TiCN) for use as a polish stop material. In a preferred embodiment, the amount of aluminum or carbon added to the titanium nitride is between about 5 and 20 percent by weight, thereby increasing the hardness of the stop material by about 30-35 percent when compared to titanium nitride alone.